Student Name _____

Teacher Name _____

School _____

System _____

ELSA
ALGEBRA I

Item Sampler

Tennessee End of Course Assessment
English Linguistically Simplified Assessment

Algebra I Form 2

Reporting Category 2: Number and Operations

PEARSON

Developed and published under contract with State of Tennessee Department of Education by the Educational Measurement group of Pearson, a business of NCS Pearson, Inc., 2510 North Dodge Street, Iowa City, Iowa 52245.

Algebra I Reference Page

Abbreviations for Geometric Formulas

A = area	d = diameter	r = radius
B = area of base	h = height	s = length of side
b = base	ℓ = length	V = volume
C = circumference	P = perimeter	w = width

Perimeter (P) and Circumference (C)

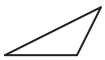
Any Polygon: P = sum of side lengths

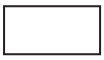
Rectangle: $P = 2\ell + 2w$

Circle: $C = 2\pi r$ or πd

$\pi \approx 3.14$ or $\frac{22}{7}$

Plane Figures — Area (A)

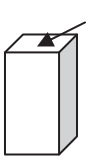
Triangle:  $A = \frac{1}{2}bh$

Rectangle:  $A = \ell w$

Circle:  $A = \pi r^2$

$\pi \approx 3.14$ or $\frac{22}{7}$

Solid Figures — Volume (V)

Right Rectangular Prism: 

$V = Bh$ or $V = \ell wh$

Cube:  $V = s^3$

Algebraic Formulas and Equations

$d = rt$ distance = rate × time

Distance Formula $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

d = distance between two points

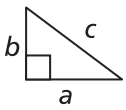
Midpoint Formula: $\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$

Slope Formula: $m = \frac{y_2 - y_1}{x_2 - x_1}$

Standard Form of a Linear Equation: $Ax + By = C$

Slope-Intercept Equation: $y = mx + b$

Point-Slope Equation: $y - y_1 = m(x - x_1)$

Pythagorean Theorem: $a^2 + b^2 = c^2$ 

Quadratics

For $ax^2 + bx + c = 0$: $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

Discriminant: $b^2 - 4ac$

Measurement Conversions

LENGTH

1 foot (ft) = 12 inches (in.)
1 yard (yd) = 3 feet
1 yard = 36 inches
1 mile = 1,760 yards
1 mile = 5,280 feet

CAPACITY

1 cup (c) = 8 fluid ounces (fl oz)
1 pint (pt) = 2 cups
1 quart (qt) = 2 pints
1 quart = 4 cups
1 gallon (gal) = 4 quarts

WEIGHT

1 pound (lb) = 16 ounces (oz)
1 ton (T) = 2,000 pounds

CONVERSION BETWEEN CUSTOMARY AND METRIC MEASUREMENT

1 yard = 0.9144 m
1 foot = 0.3048 m
1 inch = 2.54 cm
1 quart = 0.946 L
1 ounce = 28.35 g
1 lb = 0.45 kg

Contents

Introduction to ELSA Algebra I

TCAP English Linguistically Simplified Assessment (ELSA)

The End of Course English Linguistically Simplified Assessment (ELSA) is the End of course Assessment in "simplified" English. It is a multiple-choice test designed to measure student achievement in certain skills in two content areas: Algebra I and English II. The questions in this Item Sampler are examples of items used in the actual test.

ELSA test questions

Questions are written to test student performance in state content standards. The State Content Standards and Performance Indicators were developed by the Tennessee Department of Education. These Standards and Performance Indicators are listed on the State Department of Education Web site at http://www.state.tn.us/education/curriculum.shtml.

Test accommodations

The End of Course English Linguistically Simplified Assessment ELSA may be administered using various procedures that are used during the student's daily educational program. Certain conditions must be met for students to be eligible for Special and English Learner (EL) accommodations.

Content of End of Course tests

The testing program titled the *Tennessee End of Course Assessment* was established to meet the Tennessee mandate for end of course assessments in Tennessee secondary schools. These tests measure the Tennessee State Performance Indicators. Subject areas covered by the end of course assessments include Mathematics, Language Arts, History, and Science.

Test development

For the *Tennessee End of Course Assessment,* a staff of writers – composed both of teachers and professional test developers experienced in each of the content areas – researched and wrote the items. Professional editors and content specialists carefully reviewed all items and test directions for content and accuracy. To provide a large pool of items for final test selection, the test developers created approximately twice as many items as were needed in the final editions of the tests.

After tryout tests were administered, student responses were analyzed. Professional content editors and researchers carefully reviewed items, their data, and test directions for content, suitability, and accuracy before including certain items and test directions in operational tests.

Test administration

Tennessee End of Course Assessments are given to students as they near the end of courses that are included in the program. Students who are Limited English Proficient (LEP) will be tested using the ELSA test form. Tests may be given midyear for block schedules or at the end of the school year.

You will have ample time to read and answer each of the questions. The ELSA Algebra I test has been designed to be administered in one session and is not timed.

Calculator use is optional. Sharing calculators during testing is not permitted.

The following types of calculators/devices may **NOT** be used during the test:

- pocket organizers
- electronic writing pads or input devices
- Some examples of prohibited calculators are:
    - Casio models: CFX-9970G, Algebra FX 2.0
    - Hewlett-Packard models: HP-40G, HP-49G
    - Texas Instruments models: TI-89, TI-92, Voyage 200, TI-NSPIRE – the CAS version (The non-CAS version of TI-NSPIRE is allowable.)
- calculators that can communicate (transfer data or information) wirelessly with other student calculators/devices
- cell phones, PSPs, and/or iPods
- Students may use any four-function, scientific, or graphing calculator does not have any of the above features. The use of units that have a Computer Algebra System (CAS) is NOT allowed.

Tips for Taking the Test

Preparing for the test

- Take this Practice Test several times
- Review the Tennessee ELSA End of Course Item Sampler for Algebra I located at http://tennessee.gov/education/assessment/sec_samplers.shtml on the Tennessee Department of Education Web site.
- Become familiar with the correct way to mark answers on the answer sheet.

Before the test

- Get a good night's sleep. To do your best, you need to be rested.

During the test

- Relax. It is normal to be somewhat nervous before the test. Try to relax and not worry.
- Listen. Listen to and read the test directions carefully. Ask for an explanation of the directions if you do not understand them.
- Plan your time. Do not spend too much time on any one question. If a question seems to take too long, skip it and return to it later. First answer all questions that you are sure about.
- Think. If you are not sure how to answer a question, read it again and try your best to answer the question. Rule out answer choices that you know are incorrect and choose from those that remain.

Directions for Using the Item Sampler

This Item Sampler for ELSA Algebra I provides specific information to students and teachers. It contains examples of different item types for each Performance Indicator that may be tested in any given end of course test administration. Performance Indicators have been grouped by Reporting Categories. These Reporting Categories will be used to report information regarding performance on the end of courts test to students, teachers, schools, and systems.

The items in this Item Sampler will not be found in the end of course tests. The number of items in this Item Sampler does not reflect the emphasis of content on the test. In order to identify the emphasis of content, the ELSA End of Course Assessment Practice Test for Algebra I should be used. The Practice Test gives a better representation of content emphasis across Reporting Categories and Performance Indicators.

An Answer Key is located in Page 17. Use it to check your answers. Review items that you get wrong.

Reporting Category: Number and Operations

Numbers 1 through 15

Performance Indicator: 3102.2.1 Operate (add, subtract, multiply, divide, simplify, powers) with radicals and radical expressions including radicands involving rational numbers and algebraic expressions.

1. **Simplify $\sqrt{\frac{100x^2}{4}} - 20x$ for all $x \geq 0$.**

- **A** $-15x$
- **B** $-10x$
- **C** $5x$
- **D** $25x$

Performance Indicator: 3102.2.1 Operate (add, subtract, multiply, divide, simplify, powers) with radicals and radical expressions including radicands involving rational numbers and algebraic expressions.

2. **What is the product of $(2\sqrt{q} + 3\sqrt{r})$ and $7\sqrt{q}$, if q and r are positive integers?**

- **A** $9\sqrt{q} + 10\sqrt{qr}$
- **B** $14\sqrt{q} + 21\sqrt{qr}$
- **C** $14q + 3\sqrt{r}$
- **D** $14q + 21\sqrt{qr}$

Go On ▶

Performance Indicator: 3102.2.1 Operate (add, subtract, multiply, divide, simplify, powers) with radicals and radical expressions including radicands involving rational numbers and algebraic expressions.

3. **Simplify:** $\frac{12\sqrt{x}}{\sqrt{3}}$

- **A** $4\sqrt{x}$
- **B** $36\sqrt{x}$
- **C** $4\sqrt{3x}$
- **D** $12\sqrt{3x}$

Performance Indicator: 3102.2.1 Operate (add, subtract, multiply, divide, simplify, powers) with radicals and radical expressions including radicands involving rational numbers and algebraic expressions.

4. **Simplify:** $\left(\sqrt{3r^2s}\right)^6$

- **A** $9r^6s^3$
- **B** $9r^5s^4$
- **C** $27r^5s^4$
- **D** $27r^6s^3$

Go On ▶

Performance Indicator: 3102.2.1 Operate (add, subtract, multiply, divide, simplify, powers) with radicals and radical expressions including radicands involving rational numbers and algebraic expressions.

5. **Which number can be multiplied by $\sqrt{256x^2}$ to get $-4x$ for all $x \geq 0$?**

- **A** $-\frac{1}{4}$
- **B** -4
- **C** $\frac{1}{4}$
- **D** 4

Performance Indicator: 3102.2.2 Multiply, divide, and square numbers expressed in scientific notation.

6. **A can of soup weighs 10.5 ounces. If one ounce is about 2.84×10^{-2} kilograms, how much does the can of soup weigh in kilograms?**

- **A** 2.982×10^{-4}
- **B** 2.982×10^{-3}
- **C** 2.982×10^{-2}
- **D** 2.982×10^{-1}

Go On ▶

Performance Indicator: 3102.2.2 Multiply, divide, and square numbers expressed in scientific notation.

7.

The table shows the speed of light in meters per second through a vacuum and ice.

Speed of Light

Medium	Speed (meters per second)
Vacuum	3.0×10^8
Ice	2.3×10^8

To the nearest tenth, how many times faster does light travel in a vacuum than in ice?

- **A** 0.7
- **B** 0.8
- **C** 1.3
- **D** 1.5

Performance Indicator: 3102.2.2 Multiply, divide, and square numbers expressed in scientific notation.

8.

One day a gas station sells 3.5×10^4 gallons of gas. What is the average number of gallons pumped per car if 1,750 cars get gas on that day?

- **A** 20
- **B** 50
- **C** 200
- **D** 500

Go On ▶

Performance Indicator: 3102.2.2 Multiply, divide, and square numbers expressed in scientific notation.

9. **Which expression is equivalent to $(4.5 \times 10^4)^2$?**

- **A** 2.025×10^5
- **B** 2.025×10^6
- **C** 2.025×10^8
- **D** 2.025×10^9

Performance Indicator: 3102.2.2 Multiply, divide, and square numbers expressed in scientific notation.

10. **Simplify:** $(2.3 \times 10^{-6})^2$

- **A** 5.29×10^{-12}
- **B** 4.6×10^{-12}
- **C** 5.29×10^{-4}
- **D** 4.6×10^{-4}

Go On ▶

Performance Indicator: 3102.2.3 Describe and/or order a given set of real numbers including both rational and irrational numbers.

11. **Which number is between $\frac{25}{7}$ and $\frac{36}{8}$?**

- **A** $\sqrt{10}$
- **B** $\sqrt{11}$
- **C** $\sqrt{17}$
- **D** $\sqrt{27}$

Performance Indicator: 3102.2.3 Describe and/or order a given set of real numbers including both rational and irrational numbers.

12. **Which list shows the numbers in order from least to greatest?**

- **A** $5.32, \frac{4}{5}, \sqrt{17}, \frac{12}{5}$
- **B** $\frac{4}{5}, 5.32, \frac{12}{5}, \sqrt{17}$
- **C** $5.32, \sqrt{17}, \frac{12}{5}, \frac{4}{5}$
- **D** $\frac{4}{5}, \frac{12}{5}, \sqrt{17}, 5.32$

Go On ▶

Performance Indicator: 3102.2.3 Describe and/or order a given set of real numbers including both rational and irrational numbers.

13. **Which set of numbers is shown in order from greatest to least?**

- **A** $\{\sqrt{31}, 3.85, \frac{7}{9}, \frac{10}{16}\}$
- **B** $\{\frac{10}{16}, \frac{7}{9}, 3.85, \sqrt{31}\}$
- **C** $\{\frac{10}{16}, 3.85, \frac{7}{9}, \sqrt{31}\}$
- **D** $\{\sqrt{31}, \frac{7}{9}, 3.85, \frac{10}{16}\}$

Performance Indicator: 3102.2.3 Describe and/or order a given set of real numbers including both rational and irrational numbers.

14. **Which list shows the numbers in order from greatest to least?**

- **A** 4.36, $\sqrt{23}$, 5.108, 5.35
- **B** 5.108, 5.35, 4.36, $\sqrt{23}$
- **C** 5.35, 5.108, $\sqrt{23}$, 4.36
- **D** 4.36, 5.108, $\sqrt{23}$, 5.35

Performance Indicator: 3102.2.3 Describe and/or order a given set of real numbers including both rational and irrational numbers.

15. **Which set of numbers is in order from least to greatest?**

- **A** $\left\{\frac{17}{2}, \sqrt{49}, \frac{26}{4}, \sqrt{22}\right\}$
- **B** $\left\{\sqrt{22}, \sqrt{49}, \frac{26}{4}, \frac{17}{2}\right\}$
- **C** $\left\{\frac{17}{2}, \frac{26}{4}, \sqrt{22}, \sqrt{49}\right\}$
- **D** $\left\{\sqrt{22}, \frac{26}{4}, \sqrt{49}, \frac{17}{2}\right\}$

Reporting Category 2: Number and Operations		
Item Number	**Correct Answer**	**Performance Indicator**
1	A	3102.2.1 Operate (add, subtract, multiply, divide, simplify, powers) with radicals and radical expressions including radicands involving rational numbers and algebraic expressions.
2	D	3102.2.1 Operate (add, subtract, multiply, divide, simplify, powers) with radicals and radical expressions including radicands involving rational numbers and algebraic expressions.
3	C	3102.2.1 Operate (add, subtract, multiply, divide, simplify, powers) with radicals and radical expressions including radicands involving rational numbers and algebraic expressions.
4	D	3102.2.1 Operate (add, subtract, multiply, divide, simplify, powers) with radicals and radical expressions including radicands involving rational numbers and algebraic expressions.
5	A	3102.2.1 Operate (add, subtract, multiply, divide, simplify, powers) with radicals and radical expressions including radicands involving rational numbers and algebraic expressions.
6	D	3102.2.2 Multiply, divide, and square numbers expressed in scientific notation.
7	C	3102.2.2 Multiply, divide, and square numbers expressed in scientific notation.
8	A	3102.2.2 Multiply, divide, and square numbers expressed in scientific notation.
9	D	3102.2.2 Multiply, divide, and square numbers expressed in scientific notation.
10	A	3102.2.2 Multiply, divide, and square numbers expressed in scientific notation.
11	C	3102.2.3 Describe and/or order a given set of real numbers including both rational and irrational numbers.
12	D	3102.2.3 Describe and/or order a given set of real numbers including both rational and irrational numbers.

13	A	3102.2.3 Describe and/or order a given set of real numbers including both rational and irrational numbers.
14	C	3102.2.3 Describe and/or order a given set of real numbers including both rational and irrational numbers.
15	D	3102.2.3 Describe and/or order a given set of real numbers including both rational and irrational numbers.